

Description of the External Genitalia in *Oncodes basalis*
Walker (Diptera, Cyrtidae) and Some Remarks upon the
Systematics of the Genus *Oncodes*

By

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Little attention has been paid to the structure of the external genitalia in the Cyrtidae and they have been described in only four genera, *Cyrtus* (Collado, 1932), *Eulonchus*, *Oncodes* and *Opsebius* (Cole, 1927). In the genus *Oncodes*, Cole has dealt with two American species and in this paper a Tasmanian species, *Oncodes basalis* Walker, is described. The terminology used is that of Snodgrass (1935).

The external genitalia in *O. basalis* are described from a long series of these flies collected at Upper Blessington, Tasmania, in the summers of 1934 and 1938.

EXTERNAL GENITALIA OF FEMALE

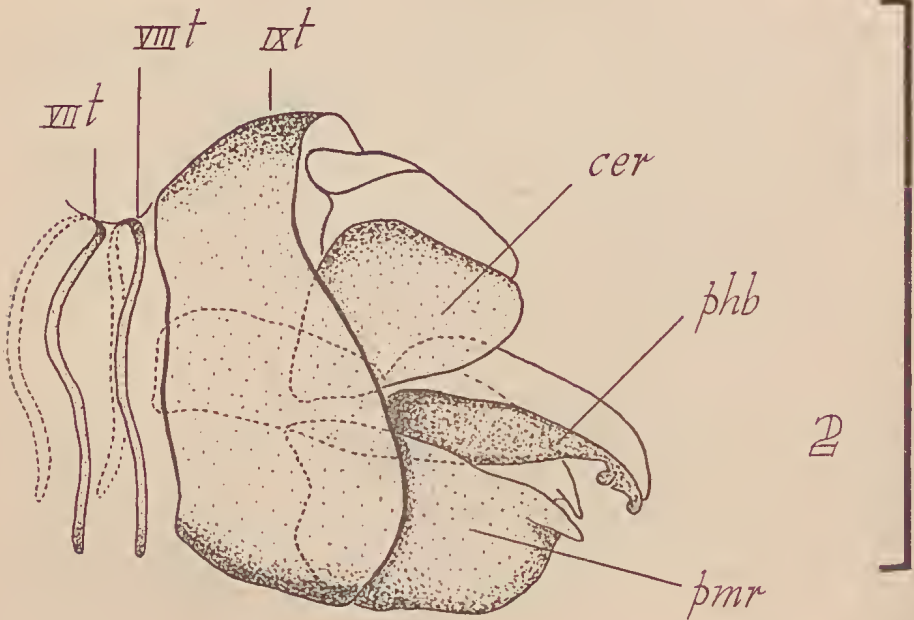
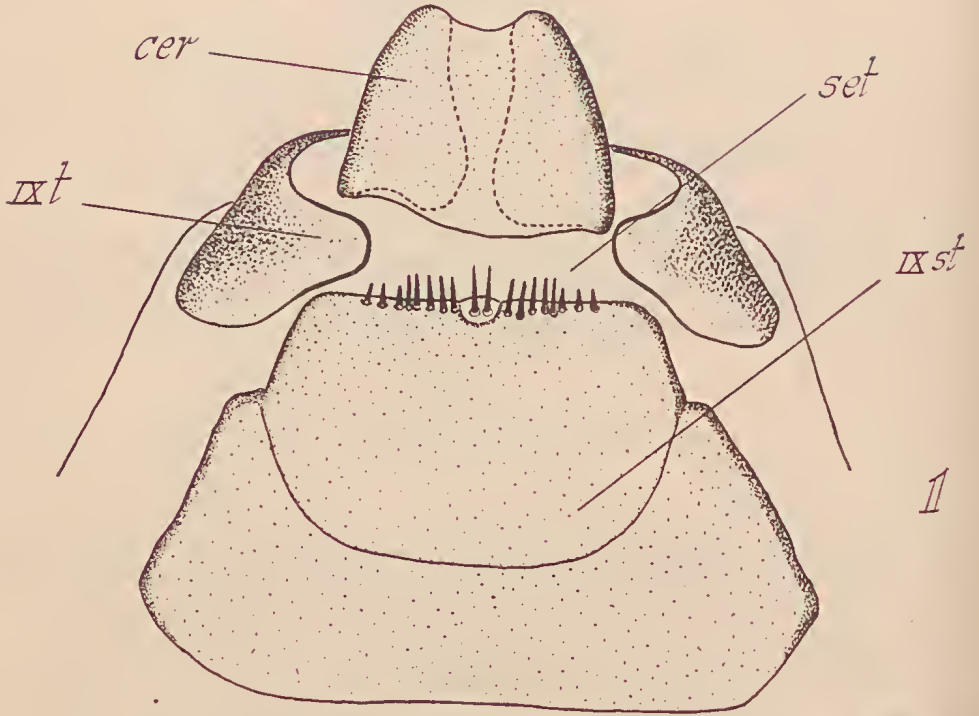
The external genitalia of the female consist of the modified ninth abdominal segment and the cerci (Fig. 1). The ninth segment consists of a collar-like tergite covering the dorsal and lateral regions, and a large sternal plate. The cerci consist of two blunt papillae joined ventrally by a lightly chitinised membrane.

Numerous long setae are found on the ninth segment and cerci. Those on the ninth segment occur along the posterior border of the tergite; and in a clump near each lateral margin of the sternal plate. On the cerci the setae are found on the lobes but not on the ventral membrane. Those areas of the ninth segment and cerci which do not bear these long setae are covered with numerous small setae. In addition there is a row of stout setae (Fig. 1, *set*) along the posterior lip of the ninth sternite, guarding the opening of the vulva ventrally.

EXTERNAL GENITALIA OF MALE

The terminal abdominal segments in the male comprise the seventh and eighth segments which are reduced to narrow bands, the ninth segment which bears the genitalia, and the cerci (Figs 2-5). This extreme reduction of the seventh and eighth segments found in the male does not occur in the female. The narrow bands of sclerotisation are incomplete ventrally and possibly represent the tergites. The cerci are similar to those in the female.

The ninth abdominal segment consists of a large collar-like tergite which nearly surrounds the segment, and the external genitalia which consist of aedeagus and phallobase with their associated structures. The aedeagus is a slender tubular intermittent organ whose proximal end carries an apodemal plate and lateral horns with a thin-walled vesicle lying between them. The aedeagus lies in a U-shaped sheath, the phallobase, bearing parameres. The parameres arise from the dorso-lateral



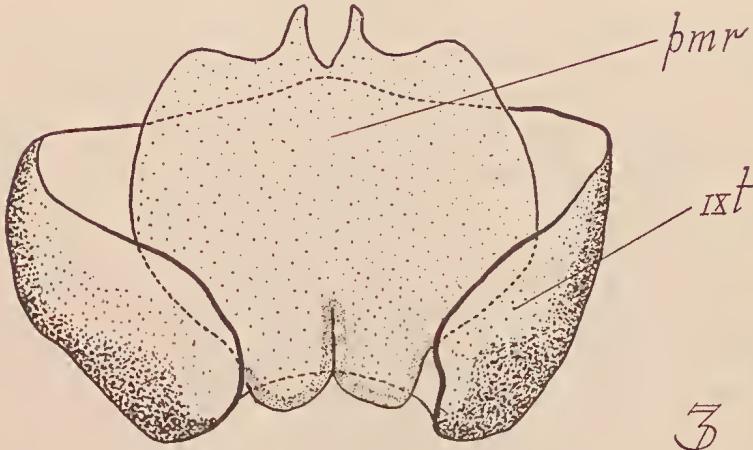
FIGURES 1-2

FIG. 1.—External genitalia of female, from below.

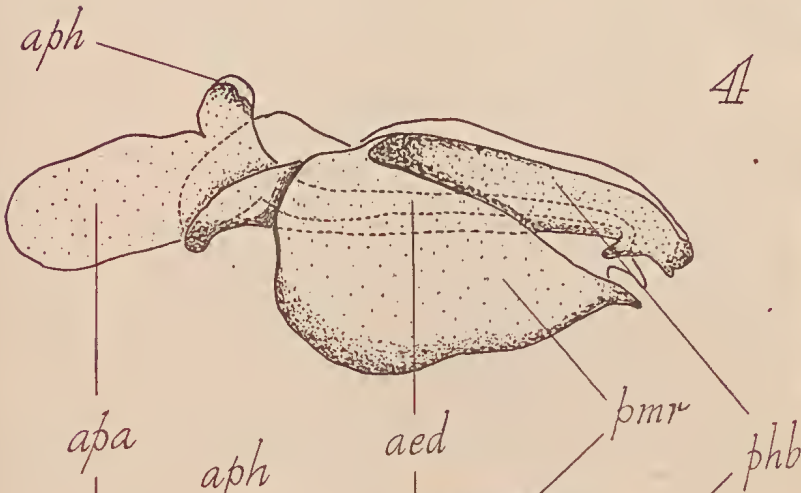
FIG. 2.—External genitalia of male, from the side.

vii t, *viii t*, *ix t*: 7th, 8th and 9th tergites; *ix st*: 9th sternite; *cer*: cerci; *phb*: phallobase; *pnr*: parameres; *set*: row of setae along posterior lip of 9th sternite.

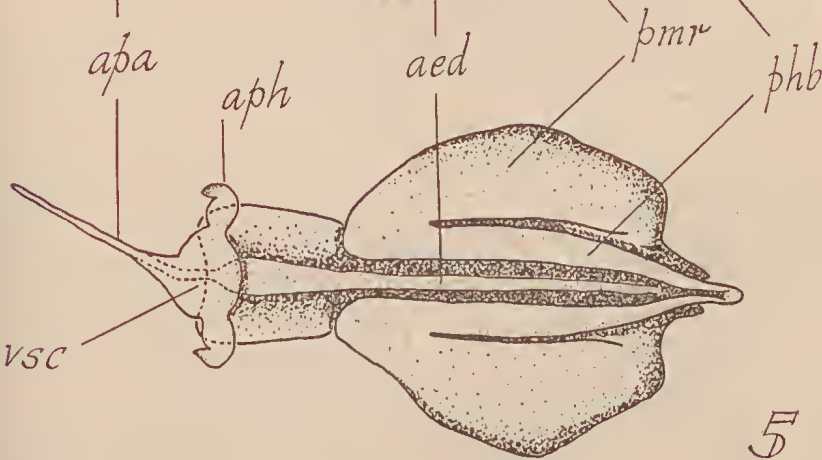
Scale: 0.5 mm.



3



4



5

FIGURES 3-5

FIG. 3.—External genitalia of male, from below.

FIG. 4.—Aedeagus and phallobase with their associated structures, from the side.

FIG. 5.—Aedeagus and phallobase with their associated structures, from above.

ixt: 9th tergite; *aed*: aedeagus; *apa*: apodemal plate; *aph*: apodemal horns; *phb*: phallobase;

pmr: parameres; *vsc*: apodemal vesicle.

Scale: 0.5 mm.

region of the phallobase about two-thirds back from its tip and unite beneath it, forming a thin-walled sac. This sac is swollen proximally, and distally bears two small papillae. Because it arises from the phallobase it is considered that this sac-like structure represents fused parameres rather than the ninth sternite and appendages. In this view the two small papillae arising from the sac are merely processes of it and are not harpagones. Moreover, they do not appear to be separately movable as is characteristic of the harpagones. It would appear that the function of phallobase and parameres in copulation is to open the vulva of the female, distension of the paramere-sac causing the tips of phallobase and paramere-sac to separate.

The external genitalia of the male in *Oncodes* appear to be of the same type as in *Cyrtus* (Collado, 1932) and in *Eulonchus* and *Opsebius* (Cole, 1927), with the same parts represented in each: aedeagus, U-shaped phallobase and parameres. Only the parameres appear to differ to any degree in the four genera; in *Oncodes* the papillae are small, in *Eulonchus* these processes are represented by recurved hooks, in *Opsebius* by finger-like processes and in *Cyrtus* by sickle-shaped processes.

DISCUSSION

Species classification in *Oncodes* is at present based upon differences in the colour of various structures, and on such differences the following species have been described from Australia:—

- O. basalis* Walker (1852): N.S.Wales.
- O. darwini* Westwood (1876): S. Australia.
- O. fortmani* Westwood (1876): S. Australia.
- O. ignava* Westwood (1876): Australia.
- O. tasmannica* Westwood (1876): Tasmania.
- O. doddi* Wandolleck (1906): N. Queensland.
- O. fumatus* Froggatt (1907): N.S.Wales.
- O. flavescens* White (1914), Hardy (1916): Tasmania.
- O. nigrinervis* White (1914): Tasmania.
- O. ater* White (1914), Hardy (1916): Tasmania.
- O. pygmaeus* White (1914): Tasmania.
- O. variegatus* Brunetti (1926): N. Queensland.
- O. insignis* Brunetti (1926): S.W. Australia.
- O. fratellus* Brunetti (1926): Victoria.
- O. castaneus* Brunetti (1926): S. Queensland.
- O. victoriensis* Brunetti (1926): Victoria, N.S.Wales, (? N. Queensland).

From an examination of a long series of specimens from Tasmanian localities Hardy (1916) concluded that White's *O. ater*, *O. flavescens* and *O. nigrinervis* from Tasmania were identical, representing variations of the same species; the long series of my Upper Blessington material also shows considerable variation in external characters, there being a particularly wide range in size and colour. Later (1918) Hardy came to the conclusion that all the described Australian forms belonged to the one species, which would therefore be known as *Oncodes basalis* Walker. In 1940 Hardy reported that the types of all described species, including those of Brunetti (1926), had been compared and that all except *O. variegatus* Brunetti (1) were identical with *O. basalis* Walker.

In spite of this conclusion that all the described Australian *Oncodes* (with the possible exception of *O. variegatus* Brunetti) are specifically identical, it cannot be said that the systematics of these flies are in a satisfactory state. The characters used in classification are subject to much variation, as Hardy has shown and as was

(1) If this is so *O. variegatus* Brunetti and *O. basalis* Walker occur together in the same area.

found, for example, in the Upper Blessington specimens. This is not surprising when it is remembered that *Oncodes*, in common with other Cyrtidae, can infect a wide range of hosts.

In contrast, however, to the considerable variation in size and colour shown in the Upper Blessington flies, the structure of the external genitalia of the males in this series was very constant, and constancy, though to a less degree, was found also in the external genitalia of the females.

In the female, particular attention was paid to the ninth sternite, this being a structure in which Collado (1932) found specific differences ⁽¹⁾ between *Cyrtus gibbus* Fabr. and *C. pusillus* Macq. There was little variation in the shape of this sternite in specimens of *O. basalis* from Upper Blessington, although some variation was noted in the areas of light and heavy sclerotisation and, particularly, in the number and distribution of the stout setae forming the characteristic row along the posterior lip of the sternite (Fig. 1, *set*). These setae comprised a central group and, on each side, a row poorly differentiated into an inner series of longer setae set closely together and an outer series of shorter setae spaced more widely. The area in which the central group arose was surrounded by a slight groove and the setae stood out more or less as a clump. There were usually 2 setae in the central clump and, on each side, an inner series of 5 and an outer series of 3 setae. Individuals were noted, however, with up to 4 clump setae and up to a total of 10 setae on each side along the lip, with variation also in their length and thickness.

A few specimens of *Oncodes* from localities in New South Wales were available for comparison with the Upper Blessington material, and differences were noted in the external genitalia. In the males these were to be found in the form of the apodemal plate, and in the females in sternite 9. Hardy, also, has reported (1940) that there seemed to be differences in the male genitalia in specimens in his collections; he pointed out, in addition, that in a series from one locality there were no differences in the terminalia although there was wide variation in colour.

The apodemal plate of the N.S. Wales males was either larger or smaller than that in the Upper Blessington males, while in a series of females from the Nyngan district of N.S. Wales there were differences in the areas of sclerotisation on sternite 9, and in the setal row along the lip of this sternite there were usually 4 clump setae (6 in one specimen) and 10-11 setae (maximum 14) on each side.

Differences in the external genitalia of male and female such as have been described above, may, when long series are available, form a basis for species determination in *Oncodes*.

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⁽¹⁾ Differences were also noted in the form of the cerci.

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